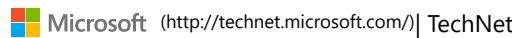


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Basics of PowerShell Looping: Foreach

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The Scripting Guys (<https://social.technet.microsoft.com/profile/The+Scripting+Guys>) April 28, 2014

■ 11 (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comments>)

Summary: Microsoft Scripting Guy, Ed Wilson, talks about using the Windows PowerShell **Foreach** statement to loop through a collection.

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Microsoft Scripting Guy, Ed Wilson, is here. When the Scripting Wife and I were in Amsterdam, Windows PowerShell MVP, Jeff Wouters, told me that a lot of people he ran across had problems looping through collections with Windows PowerShell. Here is a picture of Jeff and me.



(<https://msdnshared.blob.core.windows.net/media/TNBlogsFS/prod.evol.blogs.technet.com/CommunityServer.Blogs.Components.Web>)

Basics of looping

Looping is a fundamental Windows PowerShell concept. Actually, I take that back. It is a fundamental concept of any programming language, even batch languages. So what is the problem?

Most people coming to Windows PowerShell for the first time understand about variables. For example, if I store a value in a variable, and if I want to get at that value, it is no problem. I address the variable as shown here:

```
PS C:\> $a = 5  
PS C:\> $b = 6  
PS C:\> $c = 7  
PS C:\> $a  
5  
PS C:\> $b  
6  
PS C:\> $c  
7
```

One thing that makes Windows PowerShell easy to use, is that it automatically unravels arrays. An array is when I add more than one thing to a variable. For example, earlier I assigned three values to three variables. Now, I want to add those three variables to a single variable. So I will use **\$d** to hold an array comprised of **\$a**, **\$b**, and **\$c**. In Windows PowerShell, it is easy to see the values. I just call the variable as shown here:

```
PS C:\> $d = $a,$b,$c
PS C:\> $d
5
6
7
```

I can also access the values of the variables by position in the array. The first position is [0], and the last position in our array is [2]. So I can access specific elements from the array by using the position numbers. This is shown here:

```
PS C:\> $d[0]
5
PS C:\> $d[1]
6
PS C:\> $d[2]
7
PS C:\>
```

Walking through the array

Suppose I want to add the number five to each of the three values I have in **\$a**, **\$b**, and **\$c**. If I work with them individually, it is easy. I just do the following:

```
PS C:\> $a + 5
10
PS C:\> $b + 5
11
PS C:\> $c + 5
12
PS C:\>
```

The problem comes with the values I have in my array that is in the **\$d** variable. In Windows PowerShell, if I add 5 to my **\$d** variable, I end up actually adding the value as another element in the array. This is shown here:

```
PS C:\> $d + 5
5
6
7
5
```

To add the number five to each of the elements in the array, I need to walk through the array by using the **Foreach** command. To use the **foreach** command, I need to do three things:

1. I call the **Foreach** command.
2. I use a pair of parentheses, I use a variable for my place holder (enumerator), and I use the variable that is holding the collection.
3. I use a pair of curly braces (script block) that includes the script that does what I want to do.

The placeholder variable I use represents the current item from the collection that I will be working with. The variable only gets a value inside the script block, and it will always be a different item each time I loop through the collection. The **Foreach** command is shown here:

```
Foreach (placeholder variable IN collection)
{
    What I want to do to the placeholder variable
}
```

In my example, the **Foreach** command is shown here:

```
Foreach ($i in $d)
{
    $i + 5
```

}

Here's the entire script:

```
$a = 5
$b = 6
$c = 7
$d = $a,$b,$c

Foreach ($i in $d)
{
    $i + 5
}
```

The command and the output from the command are shown in the following image:

The screenshot shows the Windows PowerShell ISE interface. The top window is titled "Windows PowerShell ISE" and contains the script code. The bottom window is a terminal window showing the execution of the script.

```
Windows PowerShell ISE
File Edit View Tools Debug Add-ons Help
Foreach.ps1 X
1 # -----
2 # Foreach.ps1
3 # ed wilson, msft
4 # hsg-4-28-14
5 # scripting techniques, getting started, looping
6 #
7 $a = 5
8 $b = 6
9 $c = 7
10 $d = $a,$b,$c
11 Foreach ($i in $d)
12 {
13     $i + 5
14 }
```

```
PS C:\> E:\Data\ScriptingGuys\2014\hsg_4_28_14\Foreach.ps1
10
11
12

PS C:\>
```

Completed | Ln 13 Col 8 | 135%

(<https://msdnshared.blob.core.windows.net/media/TNBlogsFS/prod.evol.blogs.technet.com/CommunityServer.Blogs.Components.Web.4-28-14-02.png>)

That is all there is to using **Foreach** to loop through a collection. Looping Week will continue tomorrow when I will talk about using **Foreach-Object** in the pipeline.

I invite you to follow me on Twitter (<http://bit.ly/scriptingguystwitter>) and Facebook (<http://bit.ly/scriptingguysfacebook>). If you have any questions, send email to me at scripter@microsoft.com (<mailto:scripter@microsoft.com>), or post your questions on the Official Scripting Guys Forum (<http://bit.ly/scriptingforum>). See you tomorrow. Until then, peace.

Ed Wilson, Microsoft Scripting Guy

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Vidyasagar Machupalli (<https://social.technet.microsoft.com/profile/Vidyasagar+Machupalli>)

October 15, 2018 at 8:40 am (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-121493>)

Good ps1 script about looping...Thanks

[Reply](https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121493#respond) (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121493#respond>)



Anonymous

October 15, 2018 at 8:40 am (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-121503>)
In this example '\$i' is just a placeholder.

It's just a variable named ' i ' .

You could call it : "\$AnyThingYouLike"

[Reply](https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121503#respond) (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121503#respond>)



Anonymous

October 15, 2018 at 8:40 am (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-121513>)
Now that's a great starters example for everyone who wants to learn looping in PowerShell.

Maybe you could explain to everyone (inc. Jeff 😊) what the difference is between foreach and foreach-object.

[Reply](https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121513#respond) (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121513#respond>)



Victor Ashiedu (<https://social.technet.microsoft.com/profile/Victor+Ashiedu>)

October 15, 2018 at 8:40 am (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-121523>)
ForEach is very useful but I'll like to know the difference with ForEach-Object

[Reply](https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121523#respond) (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121523#respond>)



Joe

April 28, 2014 at 4:14 pm (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-121543>)
Does it need to say Foreach (\$i in \$d)? Where does the "\$i" come from? I understand in C and C++ you have to declare it in a loop, (i=0, i>10, i++) . I am not sure where and how the \$i works in powershell yet.

[Reply](https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121543#respond) (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121543#respond>)



Joe

April 29, 2014 at 12:09 am (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-121473>)
Thanks Gaff, so you never have to declare it? you can just use whatever you want as long as you reference the name of the array?

[Reply](https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121473#respond) (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121473#respond>)



markus

May 10, 2014 at 8:23 am (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-121553>)
Do I need to declare a variable first to be able to use a Foreach-Object cmdlet?

Can I use for example: get-moverequest | select identity | % {get-moverequeststatistics}

In that example, the mandatory Parameter "identity" isn't parsed to the get-moverequeststatistics.... But why?

[Reply](https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121553#respond) (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121553#respond>)



zalek

November 13, 2014 at 11:21 pm (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-121533>)
why the output file was not changed? Here is my code:

```
$batch = Get-Content $file
foreach ($l in $batch)
{
    if ($l.StartsWith('02 '))
    {$l = '05 ' + $l.Substring(3)}
}
```

Set-Content \$outFile \$batch

The output file was the same as the input file, but the code changes '02 ' to '05 '.

Thanks,

Zalek

[Reply](https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121533#respond) (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121533#respond>)



JoeT

January 28, 2015 at 11:11 pm (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-121483>)
I'm totally new to PS. I'm trying to reset all 18K user account password to a uniquely generated password for each account that I have populated in a .csv file.

Here's the script that I'm using but I got the following error message – "Unexpected token 'in' in expression or statement". What did I do wrong? Thanks in advance for helping!

```
connect-msolservice
```

```
$Users = Import-Csv C:\Users\xxx\Documents\passwordTest.csv
foreach($User in $Users){
    set-msoluserpassword -userprincipalname $User.UserPrincipalName -newpassword $User.NewPassword
}
```

[Reply \(https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121483#respond\)](https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121483#respond)



vishnu

July 27, 2015 at 1:27 pm (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-150001>)
Greatttt . I am just a beginner. i was struggling to get the concept of this. This helped me lot.
Thanks,

[Reply \(https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=150001#respond\)](https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=150001#respond)



James III

January 5, 2016 at 6:29 pm (<https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-167261>)

Isn't easier to write the script as follows:

```
$digits = 2,3,4,5
foreach($digit in $digits) {
    $digit + 3
}
```

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